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The COVID-19 lockdown provides clues for better science communication on environmental recovery

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Many countries around the world have locked down their populations to control the spread of COVID-19. During this lockdown, social media has sparked social optimism with vision of wildlife 'coming back'. These striking images show unexpected sightings of iconic animals, such as pumas, jackals and kangaroos, in usually crowded cities. The reaction by the media and society has been of wonder and hope. This optimism has gone as far as creating the social perception that our activities only have a temporary effect on wildlife and, if we reduce our frenetic pace of economic activity, nature will quickly return. This hopeful response highlights a persistent issue for scientists (Knowlton 2021). How can scientific information be communicated that allows for optimism, which engages society, whilst being true to the science, which often is grounded in realism that is often pessimistic?

Social media is fast becoming one of the primary ways in which society informs itself about the world (Sterrett et al. 2019). A key problem is that it can also be an unreliable source of information, especially with growing concerns about fake news stories that might distort perceptions of reality (Pennycook & Rand 2018). Despite this, the public holds a rather positive view that science is beneficial to society and that scientists in general tend to be trustworthy (Hendriks et al. 2016), despite activity by certain media sources to erode trust in scientists (Hmielowski et al. 2014).

A key problem for scientific communication is striking the balance between optimism and pessimism. Optimism is a powerful motivator for human progress, but unchecked it can be a self-deceptive state. Yet pessimism disempowers. Both states promote inaction (McAfee et al. 2019). The images of emerging wildlife during the COVID-19 lockdown have inspired societies once in fatigue from persistent pessimism of environmental degradation to overt optimism. The widespread and penetrating influence of humans on ecosystems has been overlooked by the media in favour of optimistic news during lockdown (Davidson 2020, Lawton 2020), ignoring the reality that many ecosystems have diminished past the point of no return (Blomqvist et al. 2013), even if the lockdown were to be permanent (Myllyvirta 2020, Wang et al. 2020).

Perhaps one of the most outstanding examples of environmental improvement has been the recovery of the Antarctic hole in the ozone layer (Solomon et al. 2016, de Laat et al. 2017). Similarly, improving the environment post-COVID-19 requires a sustained effort by citizens and their governments. To avoid denialism and remain grounded in reality, there needs to be understanding that environmental degradation will accelerate as human activities intensify (Cheng et al. 2020). Yet people are showing each other hopeful images of cherished species (Duarte et al. 2020), suggesting that there is an opportunity to remind people of the links between healthy ecosystems and their well-being (Corlett et al. 2020).

Social media has been a source within which citizens have shown their enjoyment of the environment and their optimism for the future. Citizens have circulated pictures of blue skies from cities usually shrouded in smog (Marlier et al. 2016) and satellite image data showing a sharp drop in atmospheric nitrogen dioxide. This is an optimistic contrast with forecasts of over 7 million deaths per year as a result of air pollution (Lelieveld et al. 2015). Whilst air quality is highly sensitive to sudden changes in human activity (Le Quéré et al. 2020), a post-COVID-19 world is set for a substantial increase in pollution-driven deaths. The idea that blue skies and returning wildlife can be readily achieved through improved management in a post-COVID-19 world is rather hopeful and could be deceptive. It contrasts with a long history of wholesale species loss (Krumhansl et al. 2016, Venter et al. 2016, Allan et al. 2017, Hughes et al. 2017, Cherlet et al. 2018, Evans et al. 2018, Kroodsma et al. 2018, Sommerfeld et al. 2018, Bryan-Brown et al. 2020). The underlying multifaceted substrate of the contradiction between optimism and pessimism in the environmental debate, regardless of the current pandemic, has been studied (e.g., Etner et al. 2009, Gifford et al. 2009, Kaida & Kaida 2019, Nordgren 2021). Yet there may be signs that some systems might get a boost from the lockdown

(Rutz et al. 2020), which gives some hope that humankind might be able to foster a more inclusive planet of species coexistence.

Scientists are considered to have expertise, integrity and benevolence, such that the public feel assured when they consider both what is said and who said it (Hendriks et al. 2016). Scientists have the opportunity to be more effective if they strike a balance in communicating knowledge that creates pessimistic and optimistic thinking (McAfee & Connell 2019). Optimism is at the core of change. Helplessness is at the core of disengagement. And the current enthusiasm for hopeful images of returning species provides an opportunity to strike a balance with solution-focused stories on why these animals have returned and what environmental opportunities they represent. We suggest four steps through which science communicators may leverage these enticing images for greater conservation engagement:

(1) Provide a dose of environmental reality to build awareness that cities have displaced beloved wilderness, pushing species out of their historical homelands that are largely forgotten.
(2) Generate optimism for nature's recovery, citing that animals can adapt to a human-dominated world and that co-managing landscapes for humans and wildlife has enormous social and environment benefits.
(3) Provide solutions. For people to believe that their actions may make a difference, they need to believe in their actions, and scientists can offer this belief. Scientists will know what engagement is needed, be it conservation volunteering, fundraising or petition-signing. Providing such agency is key to making the message stick (McAfee et al. 2019).
(4) Emphasize the current opportunity to turn a negative into a positive by reminding people that the lockdown is a consequence of the mismanagement of natural resources. However, collectively, how ecosystems are managed can be improved to reduce the likelihood of future failures by taking advantage of the widely resonating influence of COVID-19's 'Anthropause' to promote environmental activism and reforms (Young et al. 2021).

The COVID-19 pandemic has provided an insight into public psychology, which has been inspired by the news of an apparent 'recovery' after years of news of environmental loss. This public switch from environmental pessimism to environmental optimism has been just as inspiring for scientists. In the age of social media, scientists are uniquely positioned to have a positive influence.

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